WEB-BASED SOFTWARE LOGISTICS

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Introduction

Transforming the Army into a knowledge-based force requires unprecedented reliance on complex and interoperable software systems. The following hypothetical situation illustrates the complexity of making even minor changes to deployed systems during sustainment:

The Software Subsystem Lead Engineer is pleased. It's been three spirals in the evolutionary acquisition process, and finally the new Land Warrior power management software module has proved its value. With the new software upgrade, systems will run 20 percent longer on the same set of batteries. Tests have also proved the new software reliable. Soldiers can now perform their battlefield missions with fewer batteries. There's one problem, however, more than 2,200 systems are fielded to 4 different locations, with some units also deployed. Installing the software upgrade will require a traveling team to modify the systems and train soldiers. This could take more than 6 months.

This illustration depicts the complexity of sustaining individual units when software or other modifications are needed to address performance, safety, or reliability issues. Typically, updating software for field units is a complex, manpower-intensive, and time-consuming activity. A materiel-fielding team of engineers and trainers travels to the unit's location, installs software, and then trains the soldiers. As Army transformation proceeds, a more responsive and efficient model for software sustainment is necessary. Project Manager (PM), Soldier Systems, in partnership with the U.S. Army Communications-Electronics Command (CECOM) Software Engineering Center (SEC), is addressing this challenge. PM, Soldier Systems personnel plan to leverage Internet and commercial technologies to establish a Web-based software logistics system that meets the response needs of future Land Warriors and Objective Force soldiers.

Web-Based Software

Web-based software logistics includes processes and products that leverage integrated commercial technologies. It provides a responsive and flexible software sustainment system by eliminating reliance on paper, software media, and manual processing. Web-based software logistics reduces the manpower footprint, increases sustainment effectiveness, and enhances warfighter readiness. It also provides increased visibility and control at various levels of the software sustainment process. In addition, Web-based logistics provides a framework that is adaptable to existing and planned logistics support concepts and programs.

At the core of the Web-based software logistics system is the Global Support Center (GSC) application, developed by the CECOM SEC. The GSC includes:

- Electronic software downloads,
- A Virtual Help Desk available 24/7,
- Automated problem resolution database,
- Web-based multimedia training, and
- An interactive online user forum.

These features collectively increase the timeliness of software sustainment to the field while reducing manpower requirements. Field users access the GSC using the Internet and encrypted links, or through the Secret Internet Protocol Router Network (SIPRNET) where available. The GSC is a DOD information technology-certified and accredited application that reduces exposure to malicious code penetration and attacks. Since the GSC is Web-based, only a Web browser is required to use it.

One inherent problem with software maintenance is control and configuration management of revisions. The GSC ensures that reported problems and changes are controlled and organized, archived, and expedited through a configuration control and management process.

System Access

To access the GSC, Land Warrior or Objective Force soldiers complete an online application form via the Web, which is registered as part of the network. The GSC notifies the system administrator that a new registration is pending. The GSC administrator, working with the PM, Soldier Systems staff, validates the request. After approval, the system automatically e-mails the user ID and password.

Software Downloading

With Web-based software logistics, we eliminate a majority of the overhead manpower, and reduce the cycle time for delivering software to the field. Similar to the commercial world, the GSC software ordering and

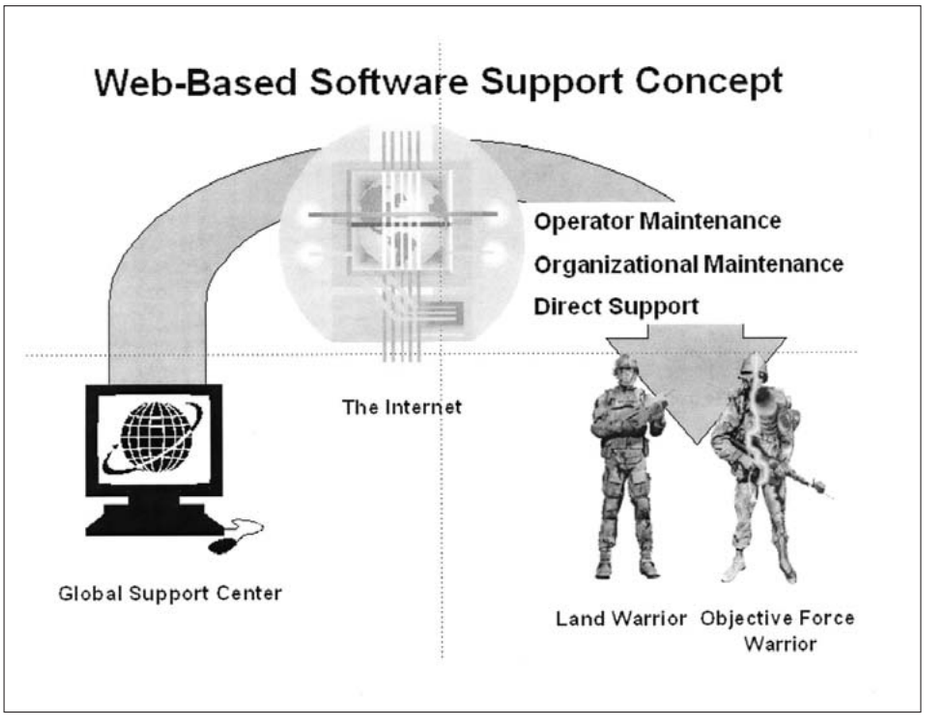
downloading system automatically provides software downloads upon request from authenticated users. The system can also "push" software releases to the field when necessary. Once downloaded via an encrypted link, the software can be accessed by the user via a secure password to decompress and decrypt it. The software ordering system includes version tracking for every download transaction. This database is used to automatically notify the field units when subsequent software releases are available.

The software ordering and downloading system can also be used for more than just software updates. For example, the system supports the ability to download digital maps. The CECOM SEC maintains an inventory of National Imagery Mapping Agency digital maps representing 98.5 percent of the world's surface. Formats include bitmap and vector-based graphics in several scales. A 650 megabyte digital map file (the largest type of map in the inventory) takes between 3.5 to 6 hours to download via a 56k Internet connection. High-speed connections reduce download time to minutes. This timeline enhances responsiveness to unit deployments and is significantly more efficient than current traveling team manual processes.

Web-Based Training

Given the geographical dispersion of Army Forces, providing centralized classroom training for software updates is difficult and impractical. With Web-based software logistics, the capability exists to deliver interactive multimedia training anywhere in the world 24/7.

PM, Soldier Systems and the CECOM SEC are in the initial planning stages for a library of multimedia training packages that include basic courses as well as refresher training. In addition, we expect to include video training packages with software downloads. The training package would include procedures for performing the software upgrade as well as "delta training" (describing the operational changes included in the new software release). Video clips with each new software release provide an efficient mechanism for training the soldier to load and operate the new software. With Web-based training, the Army reduces the need to send out training teams, allowing soldiers to train at their own pace. The online training library will provide field users with the opportunity to refresh and reinforce previous training at their convenience.



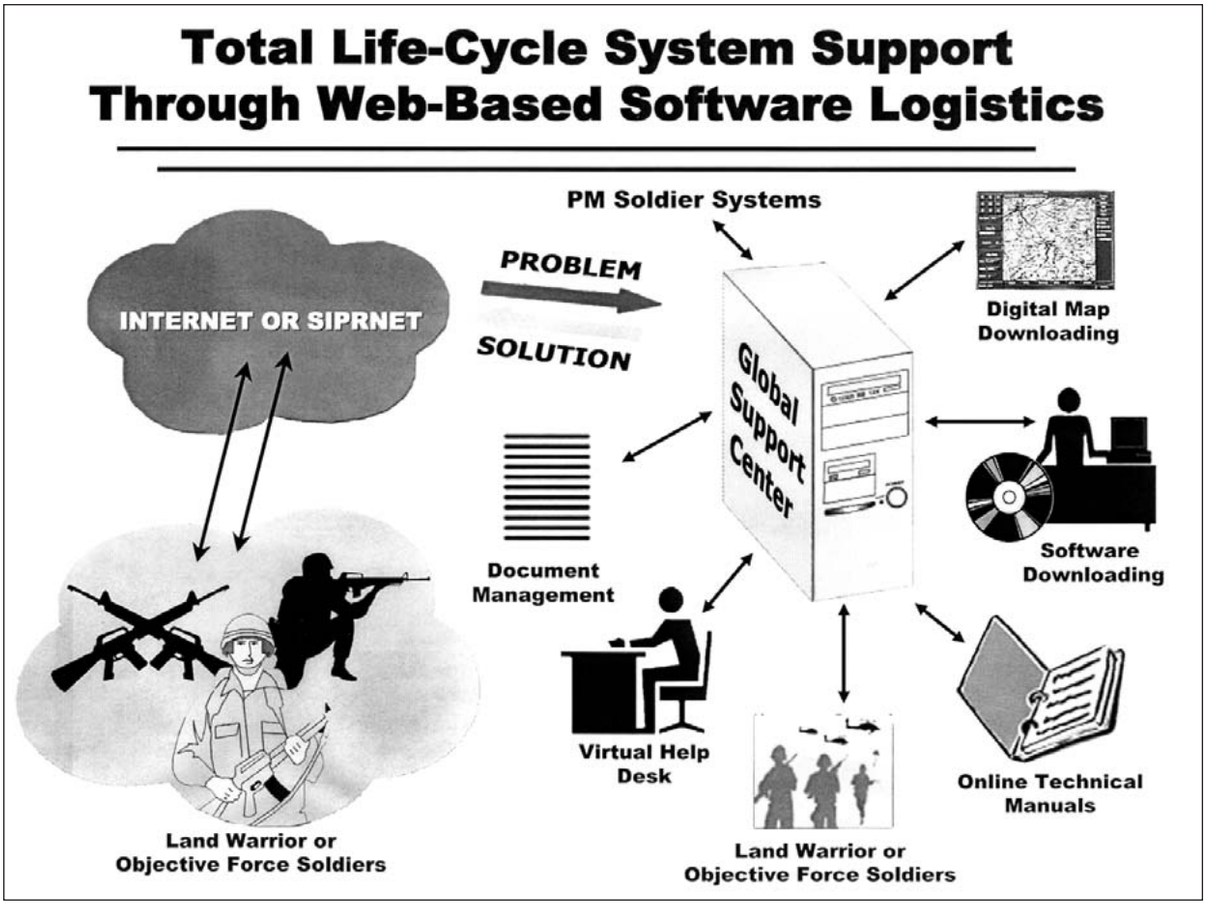
Virtual Help Desk

The Virtual Help Desk provides a collaborative environment for problem reporting and resolution that streamlines field support. By leveraging Web technologies, individuals can automatically track and distribute problem reports and solutions. In addition, collaboration is enhanced between subject matter experts (SMEs) and the soldiers in the field, regardless of their location. When a soldier encounters a problem, a search of the online database quickly determines if a solution to the problem already exists. If this is a new problem, the user submits a problem report to the GSC, and the appropriate SME receives e-mail notification. In collaboration with the soldier, the SME determines the solution or workaround, which is then posted in the database, where it is accessible to other field units. For emergency problems, the system automatically notifies the SME by pager or cell phone, providing near-real-time responsiveness. The Virtual Help Desk also includes a secure chat forum so users across the globe can collaborate on specific problems and resolutions.

The collaborative capabilities of the Virtual Help Desk can reduce the impact of software problems and help increase unit readiness. By automating the process and maintaining the problem-resolution database, warfighters have almost instantaneous access to solutions for known problems. Appropriate users receive automatic notification as new problems are encountered and resolved. Furthermore, this approach allows the capture of valuable corporate knowledge and reduces exposure to loss of specific expertise.

Online Technical Manuals

To further streamline the software sustainment process, the GSC



system provides soldiers with the ability to view and download technical publications. Types of documents contained in the GSC online repository include installation manuals, diagrams, and charts. Additionally, the system includes a Web-based document management and collaboration system to permit users to post documents to a Web site and notify other users when a new revision is posted. These capabilities, in conjunction with the Virtual Help Desk, provide soldiers in the field with critical information to maintain system readiness.

Planned Enhancements

The GSC is constantly being improved with new functionality and capabilities. Future enhancements planned for the GSC include:

• *Palm Pilot And Pocket PC Interface.* These enhancements allow mobile users to interact with the Virtual Help Desk. With on-the-move communications, SMEs will have the capability to respond to field users while away from their desktop computers. Field users will have the capability to search the problem resolution database while on-the-move.

• *Searchable Technical Publications.* A more robust and flexible search capability of documents and manuals allows the soldier to find relevant information more quickly.

Conclusion

As the Army proceeds with its transformation, the ability to synchronize software across multiple platforms while maintaining a high level of unit readiness is a challenge. Migrating to a Web-based software logistics model is imperative to help keep pace with the ambitious goals of the Objective Force. PM, Soldier Systems and the CECOM SEC are in the process of implementing this model. By leveraging Internet and Web-based technologies to provide digital software downloads, having access to SMEs 24/7, and having continuous access to multimedia training, PM, Soldier Systems provides timely software sustainment to warfighters.

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